

NNG10WA14C
RFP # NNG08214467R

Clause J.1 Attachment A

STATEMENT OF WORK

FOR

WALLOPS RANGE OPERATIONS CONTRACT

July 2010

**STATEMENT OF WORK
for
NASA's WALLOPS FLIGHT FACILITY
RANGE OPERATIONS CONTRACT**

0 RANGE OPERATIONS STATEMENT OF WORK

1 DESCRIPTION OF SERVICES

The overall scope of this contract is to provide Wallops Research Range (WRR) operations and maintenance; support services; training; command, control, communications, information and computer systems services; testing, modifying and installing communications and electronic systems at launch facilities, launch control centers and test facilities; and range technology development engineering services. This effort provides direct customer support to NASA Wallops Flight Facility's (WFFs) Wallops Research Range by providing qualified personnel, equipment, tools, materials, vehicles, specialized test equipment, supervision, and other services. NASA's WFF requires an innovative, integrated, flexible and effective management approach and the contractor must provide technical support in a planned and coordinated manner which will ensure essential WRR support systems are ready to support user requirements, and cause no impact to WRR program schedules due to equipment degradation, failures, system problems or reprioritization of program requirements. The wide variety of support systems involves careful workload planning, cost management, and scheduling of resources to identify and resolve technical systems problems.

Instrumentation systems are permanently located at WFF and at Poker Flat Research Range (PFRR), Alaska. In addition, mobile instrumentation is deployed to locations worldwide to meet Range customer requirements.

The WRR receives and provides Range support to and from various agencies. The WRR constantly strives to ensure it is prepared to accommodate the current and future needs of its customers. To that end, the contractor shall pursue ongoing preventive and corrective maintenance and engineering upgrade tasks to ensure readiness and avoid obsolescence of its current Range equipment and systems. The contractor shall also work with WFF in cooperation with other NASA Centers to conduct Range technology development projects to enable the evolution of the Range architecture to include space-based metric tracking, telemetry, and command relay, and mission planning systems.

2 GENERAL

The instrumentation systems that make up the WRR includes aging infrastructure existing in a highly corrosive environment that must continue to successfully support missions subject to schedule and requirements variability common on test ranges. These systems are located at WFF, PFRR, and deployed to sites around the world which sometimes requires simultaneous operations management and staffing at WFF, PFRR, and the additional remote sites.

The contractor shall provide timely and reliable systems operations and maintenance while achieving systems performance excellence, continuously improve customer support, and proactively pursue overall cost reductions.

The contractor shall ensure system configuration integrity and reliability, mission readiness, and service excellence.

The contractor shall provide systems dependability, customer support, and long-range planning for all systems.

The contractor shall ensure customer products and services will be provided when needed and minimize the impact system maintenance has on the range operations schedule with a balanced program of effective preventative maintenance and operational load using the technical workforce proposed.

The contractor shall provide qualified personnel, equipment, tools, materials, supervision, training, certifications and other items and services necessary to manage range services requirements and perform tests, launch operations and maintenance.

In order to comply with the Section 508 Standards for Electronic and Information Technology, the contractor shall perform all software application development in compliance with the technical standards delineated in 36 Code of Federal Regulations (CFR) Part 1194.21 Software Applications and Operating Systems unless approved otherwise by the COTR.

The contractor is not responsible for the buildings that house the majority of the range instrumentation support systems at WFF or PFRR. The Wallops Institutional Consolidated Contract (WICC) provides typical institutional services for the WFF and for buildings at the Wallops Flight Facility. The Sounding Rockets Program Office provides these same services at the PFRR.

Other traditional institutional services such as physical security, shipping, etc., are provided by the WICC contractor unless otherwise stated in this Statement of Work (SOW).

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Performing range safety operations is not the responsibility of the contractor however, the systems that are used by range safety operations personnel shall be maintained and sustained by the contractor.

3 PROGRAM MANAGEMENT

The contractor shall plan for, conduct, and administer a comprehensive integrated management program.

The contractor shall appoint a Program Manager who shall have the authority to make any necessary decisions (real time, if required) related to the performance of this contract and shall be the contractor's primary point-of-contact with NASA.

The contractor shall administer functions which include: program management, contractor ethics, range projects management, continuous risk management, contract management, materiel management, cost control management, operations and future planning, contract administration, performance measurement, mission setup, quality control, data management, integrated logistics support, property management, facility management, safety, and employee training programs.

The contractor shall review and develop draft directives, monitor work in progress and coordinate with designated Government interfaces or other vendors and contractors.

The contractor shall develop and implement an innovative management philosophy to meet evolving mission requirements for the WRR and its customers. Customers include NASA as well as reimbursable customers with range requirements. The NASA and reimbursable requirements are defined and provided by the Contracting Officer's Technical Representative (COTR) or NASA WFF Range Project Managers.

The contractor shall establish, maintain, and implement a Quality Assurance Plan (QAP) to ensure compliance with quality management requirements in this SOW and/or established by the contractor. The QAP will be an attachment and become part of the contract.

The contractor shall establish and maintain a quality management program that facilitates the accomplishment of total work responsibility including management and technical interfaces between the Government and the associated customers and other contractors.

A quality management approach is required for design, development, key product characteristics and program events.

The contractor shall plan, document, and implement a quality system that substantiates that all products and services conform to contractual requirements.

Continuous risk management practices shall be documented, implemented, and evaluated for effectiveness.

A Risk Management Plan, including how the contractor will be performing continuous risk management, shall be delivered by the contractor with their proposal.

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The contractor shall establish and maintain an automated work control system as part of their overall quality management system.

This system shall use appropriate work authorization documents to provide adequate controls and reports ensuring effective, efficient, and prompt responses to workload requirements and proper reporting of costs incurred.

The contractor shall use Maximo® Version 5.2 or greater software to perform work control management and if they choose to use Maximo® for any other services, they shall use the same version of Maximo®. The contractor is responsible for providing the Maximo® software and associated user licenses and the Government will retain ownership of all data in Maximo® upon contract completion.

Within the quality management program, the contractor shall utilize a quality management system that is compliant with the International Standards Organization (ISO) criteria. The contractor will comply with ISO 9001-2000 standards, though ISO certification is not required. The Government may choose to audit, or get a third-party to audit the contractor established ISO compliant quality management system to ensure compliance with the standard.

The contractor shall adhere to AS9100 standards for aerospace products requirements only as required in individual IDIQ Task Orders.

The contractor shall adhere to NPR 7120.5 and NPR 7120.8 for various WRR missions with the specific NPR required defined in Task Orders, Work Orders, and mission specific requirements documents.

Management standards required to be followed will be defined in mission specific requirements documents and project plans.

The contractor shall develop and maintain a Program Management Plan (PMP) for tracking programs supported, range services customer requirements, services provided, maintenance activities, actual labor hours, material costs, special projects, work requests, configuration management, and other areas the program office requires visibility.

The PMP shall define the tools and processes to be utilized by the contractor to perform the program management functions required for this contract.

The completed PMP shall be delivered with the proposal and the plan shall be updated and delivered to the COTR upon completion of each contract year.

3.1 Program Management Reporting

The contractor shall participate in meetings and reviews as requested by the government to ensure adequate communication to range operations personnel, NASA and WRR customers.

With the NASA/contractor team approach desired, success is something the TEAM must attain and those either presenting or on the board of these reviews are part of the team and desire success in all aspects.

The contractor shall provide a single review spokesperson, namely the Range Services Manager (RSM) defined in Section 4.1, covering all areas of instrumentation; however, each operational area lead shall be present during all formal reviews to answer detailed questions as needed.

The contractor shall provide a short verbal status of high priority items or items of interest during the weekly NASA Range and Mission Management Office staff meeting.

3.1.1 Range Readiness Reviews

The contractor shall support a boarded NASA Range Readiness Review (RRR) for each mission.

The RRR shall be professional, informative and of the highest possible quality.

The contractor portion of the RRR shall clearly define the contractor's understanding of mission instrumentation requirements, the implementation support plan, and how the instrumentation and personnel were verified ready to support the mission requirements.

At the RRR the contractor shall present the results of element level simulation and testing, and results of the contractor's operations (systems and personnel) performance evaluated against mission support requirements resulting from integrated WRR simulations and tests.

The contractor shall conduct pre-RRR's (dry runs) covering each instrumentation area as defined by the COTR. The pre-review may be optionally boarded as decided by the COTR.

The contractor shall document comments, questions, actions and concerns and track and report status of all actions from the pre-RRR's to the COTR using the Range Operations Management System (ROMS) defined in Section 4.

The goal of the pre-review and RRR is to eliminate preventable errors, not to critique the contractor.

The RRR shall include a presented summary perspective providing a quick overview of mission applicable issues identified, issues closed, issues open, remaining risk items, status of actions still being worked, and recently closed or recently opened applicable discrepancy reports.

3.1.2 Weekly Activity Report

The contractor shall provide a Weekly Activity Report (WAR) summarizing all technical operations and maintenance activities, and engineering activities accomplished during the previous work week period.

The WAR shall include a forecast of the technical operations, maintenance and engineering work that will be accomplished during the following week.

The WAR shall provide updates on major operations and engineering risks and issues that are appropriate for weekly communication.

The WAR shall be delivered no later than Noon every Thursday unless otherwise defined by the COTR.

3.1.3 Monthly Status Report

The overall program management status shall be provided to the COTR as a Monthly Status Report (MSR), in the format defined by the COTR, by the 10th of each month unless otherwise defined by the COTR.

The MSR is a critical communications tool in that it is a guarantee, with research range operations, mission schedules will change. With this fact, it is difficult to forecast accurately the mission costs for the fiscal year, in terms of overtime, premium labor, and travel. Because of that difficulty, contractor management of materials expenses for upgrades is critical to compensate for the variability in mission costs and reimbursable customer funding availability.

The COTR will provide the format of the MSR during the contract Phase In period.

The MSR will be a monthly presentation of the MSR package to an audience defined by the Government.

If the task order defining the work is awarded beyond the 15th of a month, the following MSR does not have to status that work, unless otherwise defined in the task order.

The MSR package shall provide detailed range support operations and systems upgrade activities, financial status, and risk and issue status.

In summary, the MSR shall contain the following information:

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- Covers ALL contract activities
- Consolidated report of engineering, operations and maintenance accomplishments and upcoming projected work activities with specific Red/Yellow/Green (RYG) issue and/or risk status for each mission defined and specific RYG issue and/or risk status for each engineering upgrade effort using the NASA/GSFC Problem/Issue/Risk RYG definitions and presentation process defined by the COTR
- Contract performance metrics as defined in Section 3.2
- Discrepancy Report (DR) status
 - Average open time for DRs assigned to Operations
 - Average open time for DRs assigned to Engineering
 - Worst case open time for DRs assigned to Operations
 - Worst case open time for DRs assigned to Engineering
- Status of deliverables
- Plan for large (over \$50K) material purchases (including purchase date, invoice date, and cost)
- Development Schedule for Each Project with Key Milestones
- Major Accomplishments for Each Project
- Project Priorities
- Staffing Changes with Justifications/Reasoning
- New Projects as a Result of Government Request or Contractor Initiated Effort
- Cancellation or Postponement of Projects with Justification/Reasoning
- Outdated systems recommended for logical upgrade based on lack of vendor support, low reliability (high failure rate), high maintenance costs, etc.
- Proposed designs, personnel resources applied to each sustaining engineering activity, sustaining engineering materials, implementation schedule and estimated costs.
- Current and projected period of performance end cost and obligation variance
- Monthly Range Summary Schedule defining additions or deletions since the last report as well as completed projects and activities.

3.1.4 Post Mission Services Report

The contractor shall provide a Post Mission Services Report (PMSR) to the COTR within two weeks of the completion of each mission. Mission completion will be defined in mission specific requirements documents or by the COTR. Critical components of the PMSR shall be at least the following:

- Results that include the performance of prime and backup systems and includes formal post-mission summary reports
- Report of surveillance and/or recovery activity
- Work performed
- Lessons learned
- Results obtained
- Recommendations

3.1.5 Wallops Integrated Institutional Management System

The contractor shall use the Government owned Wallops Integrated Institutional Management System (WIIMS) as a means of documenting and tracking task order and work order requirements of this contract.

The contractor shall provide an operable data interface between the contractor's accounting system and WIIMS within 6 months of the contract effective date that shall be demonstrated by production of accurate reporting products as defined in the SOW and RTO's.

The WIIMS system provides Government insight into contractor technical progress/schedule and cost accruals for each task order and work order for each customer.

The cost data shall be input monthly aligning with Government Form 533 submittal schedules.

Technical and schedule data inputs shall be done on a bi-weekly basis or unless otherwise required by the Government due to mission unique reporting requirements.

Unless required by the COTR, redundant technical and schedule status information already provided to the Government in another form defined in this SOW will not also be required in WIIMS. WIIMS however shall be the primary cost management reporting system.

The Government will provide WIIMS system operation training as needed.

3.2 Performance Metrics and Reporting

Additional mission-specific performance metrics beyond those defined in Section 3.2 will be defined in mission requirements documents or in specific IDIQ task orders.

3.2.1 Instrumentation System Availability

The contractor shall collect and provide monthly systems availability metrics, last six months availability metrics, and cumulative systems availability to date in the MSR.

Availability shall be defined by the following formula:

Availability = 100% * (Service Hours Required – Service Hours Not Scheduled)/Service Hours Required.

Service Hours Not Scheduled shall not include planned system downtime when impacting customer support requirements. Service Hours Not Scheduled shall include unplanned system downtime when impacting customer support requirements.

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The contractor shall collect and present planned and unplanned system downtime and include in the MSR, mission specific readiness reviews and associated reports.

The availability requirement across all systems defined below shall be 98% and in no case impact safety.

The availability shall be met across any 6-month sliding window with the window able to move in one month increments.

The systems, including any accompanying instrumentation systems/trailers that shall be reported for availability metrics are as follows:

- Fixed Telemetry 7.3-meter System #1
- Fixed Telemetry 7.3-meter System #2
- Fixed Telemetry 8-foot System #1
- Fixed Telemetry 8-foot System #2
- Fixed Telemetry 8-meter System (at WFF)
- Fixed Telemetry 9-meter System
- Mobile Telemetry 9-meter System (at PFRR, Alaska)
- Mobile Telemetry 8-meter System (at PFRR, Alaska)
- Mobile Telemetry 20-foot System
- Mobile Telemetry 7-meter System #1
- Mobile Telemetry 7-meter System #2
- Fixed Radar #3
- Fixed Radar #5
- Fixed Radar #18
- SPANDAR Radar System
- UHF Radar System
- Mobile Radar #2
- Mobile Radar #8
- Mobile Radar #10
- Mobile Radar #11
- RADAC System
- Mobile Command System
- Mobile Range Control System
- Fixed Command System (U-55 Building Systems)
- Pathfinder Surveillance Radar System

3.2.2 Data Systems Performance and Reliability

The data performance and reliability standards to be followed shall cover the full life cycle of software which includes development, test, evaluation, operations and maintenance.

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The contractor shall implement data systems development, performance, and reliability standards based on NASA Software Assurance Standard (NASA-STD-8739.8) and the contractor shall also adhere to the NASA Software Safety Standard (NASA-STD-8719.13).

For operations, the contractor shall implement software assurance practices that cover audits, reviews, and approvals associated with software changes and software induced operational workarounds. For maintenance, the software assurance emphasis shall be on collecting information for trending and reliability analysis.

To provide safety assurance, the contractor shall maintain either a fault tree or failure modes and effects safety analysis, which provides a design specific list of potential failure conditions that must be tested for all Range Safety Wallops Range Control Center systems.

Data shall be accurate, precise, reliable, and current.

The following guidelines shall be utilized for test data analysis:

- Accurate - Accurate to within a unit of required precision or to accuracy of input data.
- Precise - Based on raw input precisions, reports are expected down to at least following levels
 - Tenth of second (0.1 s) for time
 - Meter (1 m) for linear information
 - Meter/second (1 m/s) for velocity
 - Ten thousandth of degree (0.0001) for angles
- Reliable - Data is expected at a steady rate of 10 points per second.
- Current - Up to 0.1 second latency for all RADAC processing is expected, and up to an additional 0.5 second latency associated with filtering (responsiveness / reset) is expected.

Satisfactory Data Systems Mission Performance will be measured by supplying required critical data when needed.

In order to define a level of performance quality, safety systems performance shall be met at least 99.9% of the time for vehicle flight periods (approximately 15 minutes per use).

Mission critical performance shall be met at least 99% of the time for mission support periods (approximately 6-12 hours per period).

Reliability data shall be documented for the life of the system.

Each Wallops Range Control Center safety system shall meet a minimum of 99% safety reliability and 90% mission reliability.

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For newly developed or upgraded systems, a minimum of 29 initial tests shall be run. In addition, these tests shall be run to establish performance for operational systems as specified in individual IDIQ Task Orders.

Throughout life of Wallops RCC Safety systems, a record shall be maintained of pass/fail for all safety and mission supports scheduled.

A safety support shall be a period when a system is processing vehicle trajectory data (approximately 15 minutes per flight).

A mission support is a period when a system is scheduled to support an operation (from boot to shut down, approximately 6 to 12 hours).

Several safety support periods are usually part of a mission support period.

Safety and mission support periods shall be recorded and failures shall be recorded.

Reliability numbers are from statistical analysis of a binomial distribution in which a sample test result can only be pass or fail.

A 95% confidence factor is used for all calculations.

The Minimum data system reliability shall be 90% for mission supports, with a 95% confidence factor for each (non-redundant) system, with a sample mission test support defined as a day of operational support (containing several data flows).

The Minimum data system reliability for safety critical periods shall be 99% with a 95% confidence factor for each (non-redundant) system, with a sample safety test support defined as processing of a single vehicle flight trajectory (a single data flow).

3.2.3 Radar Systems Performance

Precision tracking radars shall acquire the intended target in auto-track mode within 10 seconds of presentation of intended target unless defined otherwise in mission specific requirements documents.

The precision tracking radars shall track the Radar Calibration (RADCAL) and Defense Meteorological Satellite Program (DMSP) satellites and report monthly or as required by mission specific requirements documents and meet the following RMS tracking error performance standards:

- ± 0.10 milli-radian for Radar #5
- ± 0.15 milli-radian for Radar #18
- ± 0.20 milli-radian for Radars #3, #10, #11
- ± 0.25 milli-radian for Radars #2, #8

The range error shall be less than 40 meters.

The precision tracking radars shall track 6-inch spheres monthly to maximum range and report monthly or as required by mission specific requirements documents.

The results shall meet minimum loop gain specifications for each system.

Mission-specific metrics shall be reported for each sensor and shall include:

- Target assignment(s) per radar aperture
- Acquisition success and time of acquisition
- Quality of track
- Quality of data supplied to the end customer and Wallops RCC
- Quality of recorded data

Radar operations services reporting shall be included in the PMSR.

3.2.4 Telemetry Systems Performance

For all telemetry systems, mission-specific performance metrics shall be reported for each antenna system and shall include:

- Target assignment(s) per telemetry aperture
- Acquisition success and time of acquisition
- Quality of track
- Quality of data supplied to the end customer and Wallops RCC
- Quality of recorded data

3.2.5 Mission Success Criteria

The minimum success criteria requirements that shall be met by the contractor and demonstrated by reporting specific performance metrics as defined in this SOW are:

- Metric tracking, Range Safety, Surveillance, telemetry, command and control, air traffic management, and other instrumentation objectives shall be satisfied for each mission.
- Availability and operation of instrumentation shall not cause significant delay to a mission or an unplanned safety risk during the mission.
- Critical engineering upgrades shall be completed with adequate time to test prior to the mission utilizing the upgrade as demonstrated with a regimented project management approach.

The comprehensive success criteria requirements that shall be met by the contractor and demonstrated by reporting specific performance metrics as defined in this SOW are:

- The prime equipment shall perform without data loss, unplanned safety risks, or missed surveillance targets for each mission. The trend over time shall show a reduced dependence on backup instrumentation equipment for assuring mission success. Over time the requirement for backup equipment shall be reduced, lowering the cost of operations and maintenance and increasing availability of equipment for parallel missions. These trends shall be documented and demonstrated to the Government to achieve comprehensive success.
- Continuous improvement shall be demonstrated for project management, preventive maintenance, configuration checkout, and operational procedures such that no mission delays or unplanned safety risk occurs due to instrumentation.
- Significant safety improvements, new capabilities, and/or operational savings shall be demonstrated and realized via strategic systems and/or process upgrades or implementations.

3.3 Configuration Management

A regimented Configuration Management (CM) process shall be implemented and followed for all aspects of the WRR instrumentation services including engineering, operations, and development.

The contractor shall provide configuration management of all documentation, software, hardware, mission configurations, and test scenarios.

The contractor shall propose the format, systems, tools, and detailed processes to be utilized to ensure an adequate CM process is implemented.

The CM system including all CM managed data shall be made available using password protected access using the ROMS.

The contractor shall propose how the process will be implemented.

To allow the contractor to assess the existing CM data environment, the contractor shall have their proposed CM management system with new data and legacy CM data imported and available within 3 months of contract start.

Prior to this date, the contractor shall have a process in place to allow efficient access and control of CM systems by the contractor and the Government to maintain overall CM effectiveness.

The Government will maintain Chairmanship of the Configuration Control Board (CCB) and majority on the board but the contractor shall support the balance of the CCB with individuals proposed by the contractor to be appropriate CCB members.

The contractor shall define the CCB meeting frequency in their proposal and the meeting frequency will be negotiated, if needed, during Phase In.

The contractor shall provide Independent Verification and Validation (IV&V) services as required in IDIQ task orders or detailed mission requirements documents.

3.4 Information Technology Systems Management

The contractor shall achieve and sustain IT security compliance in accordance with Federal Information Security Management Act (FISMA) policies through full lifecycle management.

The contractor shall be responsible for updating existing and develop required Security Plans, and evaluate information risk and supporting external audits during the contract in accordance with NPR 2810.1A, Security of Information Technology.

3.5 Alternate Facilities Operations and Facilities Security Management

The contractor shall provide Facilities Operations Management (FOM) and Facility Security Management (FSM) services by acting as FOM Alternates and FSM's for certain WRR facilities.

Contractor FOM Alternates and FSM's are recommended by the contractor and approved by the COTR.

The duties associated with being an Alternate FOM or FSM are very minimal and can be accomplished by an existing contract personnel residing at that location.

Any required training for these positions will be provided by the Government.

3.6 Health and Safety Management

A comprehensive and proactive health and safety program is required. The contractor shall perform the requirements of this contract using the safety and health guidelines provided within the Occupational Safety and Health Act, NASA Safety Manual, NPR 8715.3, the GSFC Environmental Policy and Program Management, GPD 8500.1, and any other directives contained in this contract.

The contractor shall ensure that employees are aware of and trained relative to safety and health requirements associated with their jobs and positions.

The contractor shall reimburse the Government for any civil or criminal fines or penalties resulting from any health and safety or environmental infractions caused by the contractor's negligence.

Smoking policy, while on duty, shall conform to NASA and OSHA standards.

3.7 Physical Security Management

The Contractor shall safeguard all Government property provided for contractor use in accordance with the clauses of this contract.

Government facilities, support equipment, and material shall be secured when not in use. The GSFC Security Manual, GHB 1600.1, will be utilized in evaluating performance under this requirement.

3.8 Human Capital Management

The contractor shall provide qualified personnel with the necessary training, security clearances, and technical expertise in the functional support areas required.

Personnel requiring certification on specialized equipment, or systems, must be certified by the vendor, a vendor approved organization, Government organization, or as otherwise required.

The WRR supports a diverse set of customer mission requirements and therefore the operational hours shall vary as individual mission requirements dictate.

Normal duty hours of operation shall be 08:00 – 16:30 local time, Monday – Friday.

The contractor shall be prepared to change work schedules to preserve a normal 40-hour/week workload while meeting mission requirements outside of the normal duty hours.

The contractor shall be prepared to shift work schedules and provide overtime services necessary to meet individual mission requirements.

The contractor shall abide by all work-hour limitation rules that are established by NASA for their own employees and manage within these bounds to maintain service availability.

Contractor personnel shall be required to travel as directed. The contractor shall perform associated travel to and from site locations for equipment and systems requiring contractor actions.

Cost associated with this travel shall be defined under the travel line item on Government cost reports and on work orders.

All travel shall be in accordance with Joint Travel Regulations.

All contractor personnel travel requirements shall be performed by the contractor including but not limited to medical certifications, passports, ticketing and transportation, and lodging.

3.9 Special Considerations

The contractor shall obtain all licenses and permits required for the performance of the work.

Unless otherwise stated definitively in this SOW, the contractor shall provide, upon completion of Phase In, the list of recommended special equipment/operations capabilities requiring specialized licensing, permits, training and certifications, and the proposed method and schedule for obtaining them.

All personnel proposed shall have at a minimum, a National Agency Check (NAC), or current equivalent as required by HSPD-12, either completed or in process.

Certain mission data such as flight profile data, vehicle radar signatures, vehicle performance data, etc. are known classified data for certain missions. Contract personnel likely to be exposed to classified data or to work closely with NASA and their customers for requirements planning, etc., shall have at least a SECRET level security classification to meet unique classified mission requirements support at the WRR unless otherwise approved by the Government at the end of Phase In.

By the end of Phase In, the contractor shall provide a list of employees who do not have SECRET level classification and for each; they shall be noted as either in progress, or being requested for exemption from this requirement with a justification.

In accordance with HSPD-12 and NASA processes, the contractor shall be responsible for completing all visitor requests for any individuals requiring access to NASA facilities or requiring access to Government IT systems in support of assigned tasks and for completing/supporting any associated access support requirements (such as visitor escort requirements, etc.).

4 INTEGRATED RANGE SERVICES MANAGEMENT

As part of the contractor's proposed quality management system, the contractor shall develop, implement, and maintain a Range Operations Management System (ROMS) that enables accurate, timely, and coordinated project planning, and is accessible by authorized personnel.

The contractor shall integrate mission operations and WRR resource requirements (facilities, runways, laboratories, instrumentation systems, frequencies, etc.) that are defined in various requirements documents or communicated in various mission planning and scheduling forums into the ROMS system.

The system shall be easily understood in a view only mode from a web accessible location, able to print very clear and understandable monthly and daily reports for meetings, and have access control capabilities that allow read/write and read-only modes of operation.

The contractor shall demonstrate an approach to design and implement the ROMS in their proposal and conduct a formal Systems Requirements Review and Operations Readiness Review with a review board defined by the Government of the ROMS within 3 months of contract start.

The ROMS shall be fully implemented and operational within 6 months of contract start.

The contractor shall define in their proposal the server space/requirements for the ROMS. The Government will provide ROMS server space, if needed in the contractor design.

If the contractor design requires the system to be hosted on the NASA network, the Government will provide the server. The Government shall retain all ownership rights of the software developed under this contract, except for commercial software elements that may be utilized to implement the system.

The contractor shall provide all source code with full documentation for all software developed by the contractor under this contract.

The ROMS shall support planning, budgeting, performance measurement, resource obligations, Range mission and operational requirements, Range system improvement efforts, and special projects as requested by the COTR.

The contractor shall provide range scheduling services for WRR mission activities that are conducted at the Wallops Flight Facility, the Poker Flat Research Range (PFRR), and at other ranges that are established or exist worldwide.

The contractor shall respond to range schedule requests from NASA Range Project Managers and the NASA WFF Test Director. The Government will maintain ultimate responsibility and accountability for range resources allocation.

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Range scheduling services shall include assigning unique project numbers to WRR missions, tracking project start/stop dates for the WRR monthly calendar, integrating Sounding Rocket, UAV, balloon and other project schedules into the range schedule, scheduling individual WRR assets/resources for specific project requirements so simultaneous operations planning can occur, assisting with frequency coordination by scheduling operational frequencies in use and reporting potential conflicts to the Government.

ROMS schedules shall include comprehensive WRR mission instrumentation systems preparation and implementation milestones in support of Range operations.

Range scheduling services shall include preparation of "Schedule of Flight Test Operations", "Summary of Flight Test Operations", "Potential Flight Test Operations" and "Facilities/System Maintenance Schedule" documents or inputs for the NASA Range and Mission Management Office Monthly Scheduling Meeting.

Range scheduling services shall include distribution of the above products to enable tracking and scheduling facilities maintenance schedules around mission operations and these services shall include scheduling project reviews, and presentation of any above information at various meetings and reviews.

The Government shall retain conflict resolution authority for the operations schedule whether that is an automated de-confliction process or manual. Any conflicts shall be identified by the contractor to the Government for resolution in a timely manner to ensure mission operations commitments.

The current range operations scheduling system is simply a mission operations timeline and can be viewed at <http://sched.wff.nasa.gov/wffsched/>.

As an integral part of the ROMS system, the contractor shall provide controlled access to Government-defined personnel to view, and in some instances schedule, range resources.

The resources to be scheduled include various processing facilities, range instrumentation systems, frequencies, buildings/labs, runways, hangars, control centers, launch pads, etc.

The system shall delineate scheduling specific requirements and project nomenclatures such as unique project numbers, project names, NASA project manager, contractor Range Services Manager, etc.

The system shall incorporate a highly capable query search tool to enable display, and print of queried data in addition to comprehensive schedules.

In addition to the delivery methods/requirements defined, all activity reports and review documentation defined in this SOW shall be uploaded to the ROMS.

To communicate the next day's range operations schedule, the contractor shall prepare the Wallops Daily Range Schedule, load it on a Government-defined server and provide a link to via email each afternoon for a COTR-approved distribution list.

In addition to the schedule of operations for the next day, the Wallops Daily Range Schedule shall list major range instrumentation systems that are unavailable due to maintenance or are off-line for whatever reason for greater than one day or the next day.

The "Wallops Daily Range Schedule" shall define when the equipment/system is scheduled to come back on line (or an estimate if evaluations are not complete).

To maintain continual quality of services improvement, the contractor shall implement an electronic Discrepancy Report (DR) entry and tracking system as part of the ROMS within four months after contract start.

DRs shall be tracked manually, at contract start, prior to the system being in operation.

Quarterly, the contractor shall conduct a detailed review of all outstanding DR's defining resolution plans during the MSR.

DRs shall be able to be generated by the contractor or NASA, under the proposed CM process, in the event of a process ineffectiveness declaration or failure, system malfunction or operator error.

A DR shall also be written by the contractor to document desired systems/process enhancements.

A DR shall be written whenever it is noticed that equipment or personnel have not performed as expected. This may occur during simulations, preventive maintenance or during a mission.

The DR's shall be tracked and resolved by the contractor or the contractor recommended team (could include civil servant subject matter experts as required) to minimize or negate future occurrence.

4.1 Operations and Engineering Project Management

To ensure thorough and effective operations planning and systems integration, the contractor shall provide mission-specific operations management support and systems and sustaining engineering services support.

The contractor shall support the NASA Range Project Managers as a member of the project team and assist NASA Range Project Managers in the technical development and establishment of a formal NASA project specific support document as required.

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The contractor shall support overall project leadership in identifying WRR customer requirements, providing required documentation, reviews, and approvals with the assignment of contractor Range Services Managers (RSM's).

The contractor's RSM's shall implement project management skills including requirements integration and test programs that demonstrate requirements verification and validation and overall readiness of the range instrumentation elements.

Under the leadership of the assigned RSM, the contractor shall conduct the following paneled reviews for each engineering project unless otherwise defined by the COTR:

- Systems Requirements Review (SRR)
- Preliminary Design Review (PDR)
- Critical Design Review (CDR)
- Operational Readiness Review (ORR) that shall document, demonstrate, and clearly justify that the upgrade is ready for transition to Operations. The review shall include a statement of certification from the Wallops Safety Office for safety systems upgrades.

The COTR will dictate range support requirements to the RSM and the RSM shall manage the range contract services specific to the mission from requirements identification phase through post-flight support phase.

The contractor shall develop a proposed technical service approach based upon sound engineering analysis principles for each mission.

This technical service design shall be provided to the Government in various forms and on a schedule defined by the COTR in the Project Support Plan (PSP).

Through this working level interaction, the contractor shall provide recommendations of technical service design.

The contractor shall present proposed support designs in formal design reviews and at related design meetings.

The technical designs proposed shall support the cost estimate provided to the Government and define gaps in mission support capabilities versus requirements and thus feed into the sustaining engineering approach.

The contractor shall produce reliable, accurate, and timely labor hours, materials, and travel cost estimates to support customer planning and execution and track and report the status of these elements in various forums and reports.

Certain individual missions included within an IDIQ Task Orders will require similar cost estimates and for those missions work orders will be generated.

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The contractor shall generate and provide cost estimates for their services for mission specific WRR customers within fifteen days of Government request unless a different delivery schedule is mutually established. This shall be done through the WIIMS for each IDIQ task order and work order.

The cost estimates for individual missions/customers shall be provided in WIIMS in a format defined by the Wallops Range and Mission Management Office.

Cost risks and issues shall be reported by the RSM in various reviews with reports delivered to the COTR and NASA Range PM on a schedule based on the project operations requirements.

The contractor shall develop and maintain a PSP for each major customer/project as defined by the COTR that tracks project requirements, services provided, applicable maintenance activities, planned labor hours, material costs, travel costs, special work requests, anticipated configuration management actions, and other areas as dictated by the unique mission requirements.

The PSP developed by the contractor for major missions and campaigns are critical to demonstrate contractor understanding of mission requirements. The PSP shall provide mission planning for other aspects of the WRR, identify risks and issues that could impact the mission success, and define critical milestones that demonstrate mission readiness capability.

The contractor shall conduct a paneled review of the PSP with a panel recommended by the contractor and approved by the COTR consisting of appropriate Government and contractor representation.

The due date for the PSP and PSP review is defined by the COTR based on mission support schedules.

The PSP shall include the information defined above and at least the following information:

- Detailed Mission Requirements that define contractor service requirements (may reference an existing requirements document but shall detail each requirement so they can be tracked using PSP)
- Systems Support Design
- Issues and Risks (using MSR risk identification process)
- Schedule with all Major Implementation, Test, and Operations Milestones
- Engineering Upgrades Required
- Contingency Plans
- Staffing Approach with Mitigations as Necessary (including subtask leads, roles and responsibilities, reporting structure, and formal reporting process)
- Simulation and Testing Activities/Plans
- Deployment Plans and Requirements if off-site

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- Cost Estimate

The PSP's shall be made available on-line utilizing the ROMS.

5 RANGE ENGINEERING SERVICES

5.1 Systems, Sustaining and Range Technology Engineering

The contractor shall provide all aspects of engineering to improve the readiness of existing systems, lower maintenance and operations costs, and enable the next-generation of range systems by identifying and implementing range technology applications.

Engineering services shall be provided to sustain existing fixed and mobile WRR systems and capabilities.

Engineering services shall include DR analysis, hardware and software maintenance support, hardware and software engineering change development, engineering test support, system maintenance plan generation and analysis, network security compliance, systems administration, configuration management, and new project/requirement assessment, including Radio Frequency link analysis.

The contractor shall provide mechanical systems sustaining engineering services unique to the systems utilized in support of WRR operations.

The contractor shall provide full life cycle engineering services that continually strive to ensure Range systems are able to meet NASA and customer requirements, evolve new requirements and improve the Range operational support process, solve system problems, and identify and reduce system risks.

The contractor shall utilize streamlined engineering change processes and procedures appropriately tailored for quick response actions that occur at the WRR while also adhering to the CM processes implemented.

The contractor shall establish a routine equipment preventative maintenance and readiness program that follows manufactures recommended procedures or the applicable sections of the Inter-Range Instrumentation Group (IRIG) Standards. Reference <http://www.irig.org> to obtain IRIG standards.

The contractor shall define, document, and implement this program and recommend applicable standards to be utilized in support of the program.

The contractor shall perform continuous systems engineering assessments necessary to provide effective sustaining engineering and reporting at various reviews defined in Sections 3.1.

Consistent with GSFC's goals, the contractor shall ensure that Capability Maturity Model Integration (CMMI®) maturity level two or equivalent is achieved for mission software, though CMMI® certification is not required.

The Government may ensure CMMI® compliance by random Government or external audits and adherence to the processes and procedures mutually agreed upon by the contractor and the Government.

The WFF currently utilizes the United States Air Force Instrumentation Radar Support Program (IRSP), which can be referenced at <https://irsp.com/>, to perform varying Depot Level Maintenance (DLM) activities for WRR radars and provide critical spares for radar systems.

The contractor shall define how they propose to perform DLM activities for the range instrumentation systems along with the estimated costs per year to implement the approach and justification of the choice made.

If the contractor chooses to utilize the IRSP for systems other than radars (radars are required to utilize the IRSP for DLM activities), these estimated costs and justifications for approach shall also be defined.

The contractor shall provide controlled access to the contractor's established preventative maintenance and readiness procedures and the associated data collected during performance of the procedures. Non-contract employees requiring access will be approved by the COTR.

As systems age, the need and opportunity for incorporating state-of-the-art system upgrades increases. In addition, as the nationally recognized WFF leadership in range technology development continues, the contractor shall identify, propose, and support the next generation of range technologies that push WFF to the forefront of low cost access to space.

The contractor shall provide range technology development engineering services and associated management for the continued development of such on-going WRR range technology projects such as the Low Cost TDRSS Transceiver (LCT2) and Autonomous Flight Safety System (AFSS) and be able to respond to these requirements in IDIQ task orders that enable the evolution of the Range architecture to include space-based metric tracking, telemetry, and command relay.

5.2 New Systems Transition to Operations

The contractor shall accept new (transitioned) systems into the WRR instrumentation suite in a process-managed, timely and organized manner so as not to cause undue delay to Government's ability to provide services.

The contractor shall support transition of systems from NASA or contractor engineering into operations by providing appropriate services and processes that enable seamless accomplishment.

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The contractor shall be responsible for surge support to accommodate transitioning of a new system if needed.

Transitioned systems shall be fully documented and configuration controlled upon transition and during development using the CM processes implemented under this contract.

In some cases, for more complex, more expensive, and highly critical systems, these new systems will be implemented and/or transitioned under a stand-alone IDIQ task. However, most systems transitioned are routine operations instrumentation or range management systems that shall be transitioned into operations by the contractor as a standard service to maintain service capability and operations performance metrics.

6 TELEMETRY OPERATIONS SERVICES

The contractor shall provide telemetry services and maintain capabilities enabling telemeter of data in support of WRR mission requirements.

The contractor shall maintain all telemetry instrumentation and trailers and provide trained and certified operations staff to provide services for operational support of a WRR local mission requiring both fixed and down range telemetry services, simultaneously with a remote mission utilizing deployed mobile telemetry services requiring no more than two complete mobile telemetry antennas and associated instrumentation systems.

Telemetry services shall include receiving, decoding, recording, relay and display of telemetered data from aircraft, uninhabited aerial systems, Sounding Rockets, Expendable Launch Vehicles (ELV's), balloon payloads, ground test articles, and satellites.

Each fixed or mobile telemetry system (single receiving aperture) shall be capable of supporting requirements of one to four downlinks.

These ground systems shall be capable, by contractor augmentation with existing subsystems within their property management responsibility under this contract, of supporting requirements that total up to 12 separate telemetry downlinks from a single receiving aperture.

This is not a system upgrade effort. This is simply a system configuration augmentation using additional hardware within the contractor's suite of support equipment under this contract.

The contractor shall provide telemetry services to enable WFF receipt of data forwarded by remote downrange telemetry receiving sites supporting missions launching from Wallops Island.

The contractor shall distribute received signal products from the Fixed Telemetry Receiving Facility in Building N-162 to the Telemetry Readout Facility in Building N-162.

The contractor shall provide data recording, telemetry best source selection, decommutation, decoding and processing, and display of data products at the Telemetry Readout Facility.

Instrumentation components shall include signal amplifiers and conditioners, bit synchronizers, frame synchronizers and telemetry processors.

Relay of data, processed/formatted data, and display video shall be provided by the Telemetry Readout Facility.

Implementation and operation of customer provided data processing and display instrumentation systems, including data communications interfaces, shall be supported in the Telemetry Readout Facility by the contractor.

Existing copper, coaxial, and fiber optic interfaces shall be utilized in this area for internal and external data communications.

All telemetry systems (both fixed and mobile) that shall be operated, maintained, and sustained by the contractor along with details and specifications on each system can be found in the Wallops Range User's Handbook at

<http://sites.wff.nasa.gov/multimedia/docs/wffruh.pdf>

6.1 Mobile Telemetry Operations

Each Mobile Instrumentation Trailer shall support one or more Mobile Antenna Systems with antenna control auto-tracking capability and associated digital and analog recording, multiple telemetry downlink receiving and combining, digital and analog slaving systems, signal distribution instrumentation, decoding and display systems, and data communications interfaces.

Mobile Telemetry Systems shall support the WRR locally or at deployed locations worldwide.

Mobile operations shall include personnel travel and services in remote locations worldwide up to five times per year with varying lengths of deployment time.

The Poker Flat Research Range (PFRR), Alaska, Telemetry Systems shall be operated and maintained by the contractor on a project or campaign required basis.

The PFRR is a range frequently utilized by the NASA Sounding Rocket Program and consists of fixed systems that reside at PFRR year-round and on some missions, require deployment of mobile systems from WFF for support augmentation.

This location shall be staffed by the contractor only during Sounding Rocket campaigns, other approved projects, or maintenance periods.

The contractor shall support PFRR campaigns and associated mobile range operations annually and shall support these remote operations at PFRR for a period up to twelve (12) continuous weeks.

Major remote campaigns to locations other than PFRR shall also be supported but this will replace the PFRR support requirement for that task order year. A Major remote campaign is defined by a operations deployment requirement of at least three mobile range systems (includes mobile radar, telemetry, command, or control center) for an off-

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site mission or the operation of a combination at least three mobile systems or fixed systems at the Poker Flat Research Range.

Maintenance trips shall be performed at least once per year during the milder weather conditions of the summer season or as defined by the contractor in their approved sustaining engineering plans.

Mobile Telemetry Instrumentation semi-permanently located at PFRR shall remain at that site unless otherwise directed by the Government.

7 RADAR OPERATIONS SERVICES

The contractor shall install, sustain, and maintain available radar instrumentation and provide trained and certified radar operations staff.

The contractor shall provide Radar Operations Services for the WRR locally, the Poker Flat Research Range (PFRR), and at other ranges that are established or exist worldwide.

Radar services may be required simultaneously for various missions based on mission schedules as defined in various Task Orders and Work Orders.

The contractor shall provide, install and qualify commercially available replacement parts for the radar systems.

Fixed and mobile radar systems include Precision Tracking Radars, Air and Surface Surveillance Radars, Specialized Science and Weather Radars, and Radar Transponder Flight Systems.

Radar Systems (both fixed and mobile) that shall be operated, maintained, and sustained by the contractor along with details and specifications on each system can be found in the Wallops Range User's Handbook at <http://sites.wff.nasa.gov/multimedia/docs/wffruh.pdf>

Radar operations services mission reporting shall be incorporated into the PMSR. However, quick look reporting shall be provided to the COTR, NASA Range Project Manager, and RSM within a time period defined by the COTR.

7.1 Precision Tracking Radar Operations

The contractor shall provide radar operations services for a WRR local mission requiring both fixed and down range mobile radar services, simultaneously with a remote mission (not the WRR local mission) utilizing deployed mobile radar services requiring no more than two complete mobile radar antennas and associated instrumentation systems.

The contractor shall respond to simultaneous mission Radar Services requirements with a support augmentation services proposal as required.

7.2 Surveillance Radar Operations

In support of launches at WFF and at locations worldwide, both fixed and mobile Surveillance Radar and Target Display Systems, including air and surface surveillance systems, shall be operated, maintained, and sustained by the contractor.

Surveillance radars shall be able to accurately identify confidence targets as defined by NASA Range Safety and mission specific requirements documents.

7.3 Research Weather and Science Radar Services

Research weather and science radar services shall be provided at the Atmospheric Scientific Research Facility (ASRF) located on the Wallops Mainland in Buildings U-30 and U-25.

Specialized/Science radars shall meet the performance measures defined by mission specific requirements documents.

In addition to the systems located on the Wallops Mainland, two mobile research radars shall be operated by the contractor on a non-interference basis and with no additional staffing attributable to these systems. These two radars, TOGA and NPOL, shall be deployed to locations around the world and shall be operated by the contractor on a non-interference basis with other duties required in support of the WRR.

If additional support is required in support of these two systems, a separate IDIQ task order will be issued.

8 RANGE CONTROL CENTER SERVICES

The contractor shall provide Range Control Center (RCC) Services at Wallops Flight Facility (WFF), Poker Flat Research Range (PFRR), and at other ranges that are established or exist worldwide.

The contractor shall maintain and sustain all Wallops Range Control Center systems.

The contractor shall operate this system as part of Range Surveillance and Recovery Operations and identify systems maintenance needs.

RCC services shall be provided at WFF and simultaneously for missions requiring support at remote locations.

The contractor shall provide necessary technical support services required to maintain permanent RCC, mobile RCC, and those RCC subsystems embedded in other instrumentation areas within current specifications.

The contractor shall provide standard mission-specific post mission data products limited to raw data, engineering unit conversion data, and 'quick-look' data outputs from control center systems.

Listings or files on electronic media of quick look data shall be available to the NASA WFF Range Project Manager within one (1) hour of completion of operation.

Specific post mission data products, including formats and delivery requirements, will be defined by the NASA WFF Project Manager in mission specific requirements documents.

Comprehensive data analysis services shall be provided as defined in various mission requirements documents provided by NASA WFF Project Managers.

Contractor personnel providing RCC services shall possess a Radar Data Acquisition Computer (RADAC) Data Quality Operator's Certificate using a process that is developed by the contractor and approved by NASA. The new process must be implemented within three (3) months of the contract's effective date.

8.1 Range Data Processing and Display Operations

The existing RADAC ingests positional data and processes it in real time.

Custom software applications provide parameters necessary to determine present position, predicted impact prediction, state vectors, and occasionally orbital elements.

Radar slaving data is also provided. In certain circumstances, plug-in type modules are used to enable special functions such as vehicle guidance, vectoring payload recovery vehicles, or tracking balloons.

Processed data is archived on the system's hard drive and may be further reduced per customer specifications.

The RADAC system hardware consists of two nearly identical workstations, named Data Quality Computer A (DQCA) and Data Quality Computer B (DQCB), which shall be operated redundantly unless otherwise defined in mission specific requirements documents.

These contractor-operated and maintained systems shall perform data ingestion, conversion, display, and reduction of various types of positional data.

These processes shall be accomplished through use of various computer and display systems with varying required levels of service.

Development and lab computers exist that are functionally equivalent to the operational DQCA and DQCB computers. Software modifications shall be performed on the development DQ computer and testing shall be performed on the DQ lab computers.

The operational systems (DQCA and DQCB), including both hardware and software, shall not to be used for engineering testing without explicit NASA approval and oversight.

8.2 Range Surveillance and Recovery Operations

As part of RCC operations, the contractor shall provide planning, management, oversight, implementation, and reporting on range air and sea surveillance and recovery activities.

The contractor shall provide a Range Surveillance and Recovery Coordinator (RSRC) to act as the lead in performing these operations in the Range Control Center and utilize existing range surveillance data, display systems, and communications systems to perform this function.

The contractor shall arrange and coordinate range surveillance/recovery services, including aircraft and boats, recovery vessels, crew, and operational services.

Except in cases where other Government agencies such as the US Coast Guard are providing services, the contractor shall provide all air and sea surveillance services.

The contractor shall identify requirements, create a surveillance and/or recovery plan, obtain approvals, and present at project reviews as defined and scheduled by the NASA Range Project Manager.

The RSRC shall attend all post-mission meetings and present results and performance.

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To ensure successful recovery operations, the contractor shall provide the boat captain with following:

- Recovery support request at least 24 hours before scheduled launch activity.
- Updates as schedule and/or requirements change.
- Pre-launch latitude and longitude position for boat.
- Predicted as well as actual payload impact latitude and longitude.
- Specific details of payload to be retrieved.
- Recovery coordination during operations.
- Guidance to recovery vessel based on control center data and displays.

In order to successfully retrieve Sounding Rocket and other payloads from the water after launch, the recovery vessel employed by the contractor shall be capable of the following:

- Speed of at least 12 knots.
- Recovery ranges out to 60 nautical miles.
- Onboard GPS.
- Marine band or more capable radio communications.
- Carrying recovery payloads up to 600 pounds.

The RSRC shall support systems engineering and management in development and delivery of range surveillance and/or recovery tools for the WRR.

The contractor shall support customization and integration of surveillance tools into WRR infrastructure by developing Project Plans for surveillance/recovery tool development, acquisition, and implementation.

The contractor shall support interfacing with other ranges, organizations, and corporations in identifying and assessing options and range surveillance technologies and tools.

On an ongoing basis, the contractor shall provide RCC Ship Surveillance System (S3) system administration and configuration management as required to support Range Surveillance Operations.

The S3 shall interface with video data communication interfaces for distribution of displays throughout the control center.

The contractor shall assume system administration of the APS-143 ground station computers located in the RCC upon systems transition to operations. At the time of writing of the SOW, these computer systems were scheduled for transition into operations in December 2008.

Contractor personnel shall have operational responsibility of the WFF SureTrak system located in the RCC.

Operations shall include pre-mission setup.

Pre-mission setup shall include entering launch trajectory and impact points into the system, which will be used to perform impact probability calculations.

The contractor shall enter reference locations, enable mission archiving, and create and upload hazard patterns for display.

The contractor shall use the WFF SureTrak systems to determine a safe to launch condition with this information communicated to appropriate NASA personnel managing the mission in the Wallops RCC.

If an anomaly is not fixed by a reboot of the system, the contractor shall inform defined US Navy Patuxent River personnel of the issue and work with them to resolve it appropriately to ensure mission operations commitments. As this system is not currently a safety critical system, the requirement to meet the Instrumentation Systems or Data Systems availability and reliability performance requirements listed in SOW Section 3.2 is not applicable.

System unavailability shall be reported and tracked within the overall operations reporting processes established by the contractor and/or defined in this SOW.

8.3 Mission Web-Casting Operations

As part of RCC operations, the contractor shall provide public and private (password protected) unclassified near real-time video and audio streaming over the Internet in response to needs of customers using appropriate services, technologies, and tools.

If additional security measures are required, this requirement will be defined in additional task orders or in detailed mission requirements.

Streaming video compatible with RealMedia™ and Windows Media™ shall be supported initially.

The Web-Casting System proposed by the contractor shall interface required photography and video data services and required communication systems for distribution over the Internet.

The contractor shall provide an assessment of user requirements and an implementation plan and schedule as part of the PSP.

The contractor shall provide research and development services as necessary to keep abreast of technology advances, security requirements, and Agency initiatives for IT communications and web-casting requirements.

9 RANGE COMMUNICATIONS, TIMING, AND COMMAND SERVICES

9.1 Range Communications and Frequency Monitoring Operations

Range communications and monitoring services shall include those services required for the multi-channel intercom system distributed throughout the WRR for use by both fixed and mobile instrumentation and range data processing and control facilities.

The contractor shall provide services and maintain capabilities enabling voice communications in support of mission operations.

Radio transceivers, transmitters, and receivers shall interface with the intercom system.

Various radio bands including High Frequency (HF), Very High Frequency (VHF), and Ultra High Frequency (UHF) are utilized by radio equipments at the range transmitting, receiving, and airport tower facilities.

These radio bands shall support ground-to-ground, air-to-ground and ship-to-shore voice communications.

Other existing instrumentation elements shall support voice communications including digital voice switches, analog patch panels, analog and digital voice recorders, analog line drivers and bridging amplifiers, keysets, headsets and handsets, antennas, and associated cabling.

The contractor shall operate, maintain, and sustain subsets of these capabilities that exist in mobile instrumentation.

The contractor shall provide services and maintain capabilities enabling inter and intra site interface to communications end equipments in all instrumentation operations sites at the WRR, in mobile instrumentation systems, and off-site locations as needed.

The contractor shall support pre-mission planning and requirements development, test planning and verification, and real-time operations.

Inter-site cable plant and circuits are provided by other organizations and the contractor shall support these organizations in establishing and maintaining communications for mission requirements.

The contractor shall provide services associated with operating and maintaining the Land Mobile Radio (LMR) system.

The LMR system shall provide trunked analog, narrow-band VHF voice communications between mobile users and base stations.

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The contractor shall provide day-to-day operations including trouble call and maintenance coordination, programming of radios, loaner pool management, and overall system monitoring for the LMR system.

The contractor shall operate and maintain the contingency Fire/Security Repeaters #1 and #2 and the Sky Screen Base Station.

Frequency monitoring shall be performed to survey the RF spectrum environment.

The contractor shall provide frequency monitoring and control services defined by mission requirements documents, or requested by the WFF Spectrum Manager and/or the WFF Range Test Director.

Existing antennas, receivers and direction finders shall be utilized to determine spectrum usages and locate sources of RF interference and unauthorized users.

The contractor shall monitor spectrum during times of controlled emissions for protection of sensitive and critical systems such as experiment payloads and Flight Termination Systems.

The contractor shall support the policy of the Shared Resources (SHARES) Program by maintaining NASA's participation as a Federal supporting entity.

The purpose of the SHARES program is to provide a backup capability to exchange critical information among Federal entities to support NSEP (National Security Emergency Preparedness). Federally controlled HF radio resources will be shared to establish a robust NSEP HF radio communications infrastructure. The program involves a collection of existing federally controlled HF radio stations that inter-operate to transmit NSEP messages when normal means of communication are not available. The SHARES System is the last avenue for emergency communications in the event of a local/regional/national emergency event.

The contractor shall operate and maintain the SHARES communications equipment and antenna systems to support this effort.

The operations personnel assigned by the contractor to perform this function shall possess the radio operators licenses required to operate within the SHARES Program.

9.2 Air-to-Ground Communications Operations

The contractor shall provide Air-to-Ground voice communications services with pointed antenna assets for low earth orbiting vehicles in support of human space flight.

Systems located at Building U-55 and the Wallops Range Control Center shall be operated, maintained, and sustained to enable communications between mission operations personnel and participating and non-participating aircraft crew.

The existing UHF-Band voice system shall be maintained and operated at Building U-55 on the Wallops Mainland per documented mission requirements primarily in support of Space Transportation System (STS) missions to enable communications with the Space Shuttle.

Air-to-Ground Communications Services shall additionally support Range Surveillance and Recovery Services.

UHF transceivers shall be interfaced with existing quad-helix antenna systems.

These communications systems shall interface with Government-provided NASA Integrated Services Network (NISN) voice/data circuits to provide connection to Mission Controllers at NASA's Johnson Space Center.

9.3 Command Operations

The contractor shall maintain all command instrumentation and trailers and provide trained and certified operations staff to provide services for operational support of a WRR local mission requiring both fixed and down range command services, simultaneously with a remote mission utilizing deployed mobile command services.

The contractor shall provide services enabling mission controller uplink of control signals to flight targets.

UHF uplink systems shall provide the capability to control or terminate flight experiments and vehicles.

Flight Termination System (FTS) communications instrumentation shall support the Wallops Range Safety function.

Command systems operated and maintained by the contractor shall generate the 20 discrete tones defined in Inter-Range Instrumentation Group (IRIG) standard.

Existing antennas shall be utilized that range from omni-directional to directional helix and quad helix configurations.

The contractor shall operate and maintain slaving, archiving, and status systems that augment the command system.

Remote control communications systems shall serve to relay Range Safety Command Panel actions to a remotely located command transmitter and to return status information.

Range Safety Command Panels shall be maintained and sustained by the contractor.

The contractor shall maintain all command antenna systems that includes Omni-directional, single helix, and quad helix arrays.

The Tone Keying System shall be maintained and sustained by the contractor.

Time division multiplex systems shall be supported to provide more secure coded transmission/reception of data for remote control as utilized for FTS command operations.

9.4 Range Timing and Countdown Operations Services

The contractor shall provide services enabling synchronization and coordination of range activities and events to coordinated Universal Time Code (UTC) and mission countdown time.

This system shall be operated, maintained, and sustained to distribute this information where accuracy is maintained to a high level at critical site locations.

The contractor shall provide these timing services at the WRR fixed range sites as well as in mobile instrumentation systems routinely deployed to locations worldwide.

The contractor shall provide Program Time (countdown) controlled and generated at the Master Timing System for distribution throughout the WRR.

Program Time shall be supported by the contractor for interactive operations control as defined by mission requirements and/or coordinated by the WFF Range Test Director.

The contractor shall maintain terminal end equipment that generates display and provides preprogrammed function control events via relay interface.

Simultaneous Program Time operations shall be supported, including routine maintenance, to enable several simultaneous countdown activities.

Timing system components that shall be maintained and operated by the contractor include GPS Synchronized Time Code Generators, Precision Frequency Standards, Time of Year and Countdown Time Generators, Time of Year and Countdown Time Displays, Time Code Translators, Function Control Units, distribution amplifiers and networking equipment, and associated test and calibration equipment.

10 PHOTOGRAPHY, VIDEO, OPTICAL TRACKING, TELEVISION, AND PRODUCTION LAB SERVICES

The contractor shall provide Photography, Optical Tracking, Television, and Production Lab Services at the Wallops Flight Facility, the Poker Flat Research Range (PFRR), and at other ranges that are established or exist worldwide.

All photographic services shall be digitally based.

Processing of video/film shall be the responsibility of the contractor to meet the product delivery requirement.

The contractor shall provide sustaining engineering, systems engineering, IT services, simulation and testing, logistics, documentation, and training and other related support services to support a continuing and successful photography and video services function.

10.1 Production and Archive Services

The contractor shall provide professional photographic and video products and graphics services for various WRR mission, administrative and marketing requirements.

The contractor shall provide graphic arts services for photography and video formatting and image editing for documentation, printing and publication and provide Wallops Range and Mission Management Office web page design and publication services.

The contractor shall provide a fully operational digital image database archive that allows WFF personnel to search based on a number of query entries such as date, mission number, mission name, and mission type within nine (9) months of contract start.

The system shall support entry of production lab product request information such as photo number, size, quality, paper type, delivery date, requestor name, and justification.

Existing archived records (non-digital) include but are not limited to, negatives and photograph proof prints.

Historical photograph negatives shall be scanned and entered into the new digital image database throughout the contract and performed on a non-interference basis with other WRR support requirements.

The new digital image database archive shall include, where the image is a scanned image of an old film negative, a reference so that the negative can be pulled for additional scanning actions as needed.

The resolution of the scanned negatives shall be at least 2400 dpi with capability to scan at 6400 dpi upon request.

Prior to transition into operation, the new database archive systems shall be reviewed and approved for operations by a boarded panel appointed by the COTR.

Once fully operational and all historical photograph negatives have been scanned and entered into the new database, the contractor shall only maintain the old photograph negatives and not the prints.

Once scanned, the old negatives shall be stored in a secure and environmentally controlled area.

10.2 Digital Photography and Video Services

Digital still photography, digital high-speed motion photography, and digital video services shall be provided for various mission requirements including range safety, Sounding Rocket, UAV, target, drone, ELV, and aircraft missions.

These services shall be provided for administrative functions including ceremonies, training, marketing communications, and documentation.

10.3 Optical Tracking Operations

Optical Tracking Systems shall be operated in their current location or deployed to support Sounding Rocket, target, UAV, drone, ELV, and balloon launches.

All mobile and fixed tracking equipment shall be operated, maintained, and sustained to support local and remote site tracking requirements.

10.4 Video Surveillance Operations

Video surveillance services shall be provided to the WFF Range Control Center to enable surveillance of WRR Airport runways and Wallops Island launch areas and launch danger areas during range operations or as requested by the WFF Range Test Director or Range Safety Officer.

Existing cameras and controllers at 15 locations shall be operated, maintained, and sustained.

All cameras must be remotely controllable at the WFF Range Test Director console in the Wallops Range Control Center.

Long range camera systems are installed on a number of radar and telemetry antenna systems and shall be maintained and sustained by the contractor.

10.5 Video, Television, and Cable Distribution Services

The contractor shall operate, maintain, and sustain WRR video distribution equipment including Cable Television (CATV) distribution and video switching systems.

The CATV system shall distribute video surveillance data and additional video sources including satellite TV receiving channels.

The contractor shall provide satellite TV services with the stations to be provided defined by the COTR.

The contractor shall maintain and sustain all video RF modulator and demodulator systems, distribution amplifiers, and RF splitters.

The contractor shall work with the Wallops IT and Communications Office, Code 708, to identify service issues related to the buried coaxial cable and fiber networks that support the CATV system.

The contractor shall operate, maintain, and sustain both NTSC and RGB video handling switches that provide source selection for distribution to discrete display and recorder destinations.

The contractor shall operate, maintain, and sustain all recording and video switching systems located in the Wallops Range Control Center and other locations including multiple instrumentation locations on the Wallops Main Base, Wallops Mainland and Wallops Island and in various Wallops Mobile Instrumentation Systems.

The contractor shall operate, maintain, and sustain all video monitors that reside in the Wallops Range Control Center and in additional locations including multiple instrumentation locations at the Wallops Main Base, Wallops Mainland and Wallops Island and in the Wallops Mobile Instrumentation Systems.

11 METEOROLOGICAL SERVICES

The contractor shall provide Meteorological Services at the Wallops Flight Facility, the Poker Flat Research Range (PFRR), and at other ranges and mobile deployments worldwide.

Meteorological services shall be provided at the WFF and simultaneously for missions requiring support at remote locations.

Meteorological services shall include weather forecasting, collection of upper air and surface weather data, collection of ozone data and pre-launch collection of data for blast and toxic dispersion required for orbital launches.

Local weather forecasts shall include daily (Monday through Friday) forecasts presented via the local WFF closed circuit television system.

Local weather forecasts shall be generated using local weather data systems and other resources as needed.

Special weather forecasts shall be provided as required for various project requirements and/or special weather events.

Twice daily balloon soundings of the upper atmosphere and associated surface observations shall be provided at midnight and noon GMT, seven days per week, in compliance with the National Weather Service (NWS) LOA for Routine Upper-Air and Associated Surface Observations at Wallops Island and the Department of Commerce.

Special balloon soundings shall be provided as required for various projects and weather events.

The contractor shall operate four dual-channel and 2 single-channel GPS radiosonde stations.

The contractor shall be responsible for spare parts, maintenance, and sustaining engineering support for these systems.

The contractor shall access and input data into the Automated Surface Observation System (ASOS) as needed for proper weather data analysis and collection.

The contractor shall provide data collection of ozonesonde data at WFF and remote project locations worldwide.

The contractor shall provide preventive and corrective maintenance services for the Digital Ionospheric Sounding System (DISS) and Dynasonde systems located on the Wallops Main Base with major parts being provided by NASA.

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Weather data shall be collected from sensors located on the Wallops Main Base and Wallops Island and Wallops Mainland and shall be archived and displayed continuously on the WFF closed circuit TV system.

The contractor shall provide meteorological forecasting services to meet mission requirements and propose personnel that possess a bachelor's degree in meteorology or have a demonstrated minimum of five years certified experience within the last ten years providing meteorological forecasting services.

The contractor shall ensure personnel that are responsible for making upper air and surface observations possess a National Weather Service "Certification of Observers". The certification shall be completed prior to the end of the contract Phase In period.

The contractor shall provide all support services such as sustaining engineering, systems engineering, IT services, simulation and testing, logistics, documentation, and training in the appropriate level necessary to support a continuing and successful meteorological services function at the WRR.

The maintenance actions required to keep the systems operational and able to meet mission requirements and performance metrics shall be defined by the contractor in their range sustaining engineering plans.

The contractor shall operate, maintain, and sustain the following primary fixed and mobile meteorological systems.

- 8-foot L/S-Band Receive Antenna System (See Reference to this system in Telemetry Operations Services section)
- GPS Radiosonde Receiving Stations
- Leading Environmental Analysis and Display System (LEADS)
- Automated Surface Observation System (ASOS)
- Wallops Surface Observation System
- Digital Ionospheric Sounding System (DISS) – maintain and sustain ONLY
- Dynamic Sounding System (Dynasonde) – maintain and sustain ONLY
- Low Altitude Wind Measurement Systems (located on 300-foot tower on Wallops Island)
- Ceilometers
- Lightning Detection Systems
- E-field Measurement System
- Tethered Aerostats
- Associated Meteorological Systems at the Atmospheric Science Research Facility

In some cases, such as ASOS, the contractor shall notify appropriate responsible maintenance organizations such as NASA or the National Weather Service, when systems operations issues occur.

12 MOBILE ELECTRIC POWER and HYDRO-MECHANIC SERVICES

The contractor shall provide Mobile Electric Power Services at the Wallops Flight Facility, the Poker Flat Research Range (PFRR), and at other ranges that are established or exist worldwide.

Mobile electric power services shall be provided at the WFF and simultaneously for missions requiring support at remote locations.

As with all contract maintenance functions, the DLM and other related maintenance actions required to keep the systems operational and able to meet mission requirements and performance metrics shall be defined by the contractor in their range sustaining engineering plans.

In conjunction with operations, the contractor shall define commercial electric power services requirements required at remote sites. The contractor will not be required to provide the services. The Government will utilize the contractor developed requirements to obtain these services and have these services interfaced to a demarcation point that includes contractor operated and maintained power stands that are currently part of the mobile electric power systems.

Further, the contractor shall provide services for design and installation of the overall remote site power distribution to all WRR assets.

The contractor shall provide sustaining engineering, systems engineering, IT services, simulation and testing, simulation and testing, logistics, documentation, training, and related support services in the appropriate level necessary to support a continuing and successful mobile electric power services function.

The contractor shall maintain and sustain diesel generators and rotary frequency converters that are part of the electric power generating equipment, small gasoline and diesel generators used for power systems, mobile antenna transportation trailers containing hydraulic or electro mechanical mechanisms for erecting antenna pedestals, and numerous electro mechanical or hydraulic operated antenna pedestals installed at permanent and remote sites.

In addition to providing electric power to the tracking, data acquisition and communications systems at remote locations, utility electric power shall be provided for assembly buildings, rocket launchers and other remote site users as required.

The electric power systems currently in use shall maintain single and three phase designs.

The mobile electric power systems are installed in ISO portable containers and shall be able to be transported over the road on flat bed trailers.

The contractor shall operate, maintain, and sustain Frequency Converter Systems #1 and #2.

The contractor shall also operate, maintain, and sustain the supporting power distribution equipment consisting of power stands, transformers, switchgear, circuit breakers and fuses, load banks, etc.

13 AIR TRAFFIC MANAGEMENT SERVICES

The contractor shall operate the WRR Airport Control Tower for the control of air and ground traffic in accordance with the following conditions and standards.

The tower shall be staffed Monday through Friday with Control Tower Operators (CTO's) between 0800 and 1630 local (excluding Federal holidays and weekends) and at other times, as required, to support special projects.

While operating the WRR Airport Control Tower, the CTO's shall comply with Federal Aviation Administration (FAA) regulations at 14 CFR Part 65, Subpart B pertaining to Air Traffic Control Tower Operations; FAA Air Traffic Control Procedures FAA Order 7110.65; and NASA Procedural Requirements (NPR) 7900.3 - Aircraft Operations Management.

The CTO's shall possess an FAA Air Traffic Control Tower Operator's Certificate.

A weather observer certification and a WRR Airport qualification by the FAA shall be required for operation of the WRR Airport Control Tower.

All required FAA certifications shall be obtained by the contractor staff operating the Air Traffic Control Tower within two months after contract start and if personnel are not fully certified at contract start, the contractor shall ensure the tower is staffed with certified operators until the contract staff is certified. In other words, the tower operation shall have no down time as a result of lacking CTO certification.

The CTO's shall be fully trained and demonstrate capability to operate all equipment, currently installed in the WRR Airport Control Tower.

The CTO's shall maintain efficiencies in their processes and operational requirements and present a Quarterly Improvements Report to the COTR on any recommended service improvements and/or training needs, including systems enhancements for overall increased safety or proficiency.

The contractor shall keep a record of all IT related support systems and define any new or related products that will be required to meet mission needs of the WRR Airport and to ensure high quality service and safety assurance.

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CTO's shall work with NASA Project Managers in the conduct of WRR projects which may require a temporary or partial closure of the airport to accommodate research project requirements.

Attendance at all range reviews requiring WRR Airport services is required and shall include readiness state and preparedness status for the CTO activities required to meet specific requirements as defined by the Government in formal mission requirements documents and reviews.

In addition, the contractor shall provide air traffic management subject matter expert services for all mission planning needs that support WRR operations.

Air Traffic Management support services shall also include analysis of project requirements, goals, and objectives and presented in appropriate mission reviews/meetings.

The analysis shall include guidance and analyses for both operational and business improvement efforts in addition to formal analyses, white papers, and/or reports.

For systems enhancements supporting the operation of the control tower, the contractor shall participate in the implementation of components and facilities, required for the enhancement initiative.

The contractor shall perform and support functions while on duty in the WRR Airport Control Tower related to, and in accordance with, airport emergency plans, wildlife control plans, runway safety inspections, airport security procedures, the permit/prior (PPR) submission process, and air traffic management.

The contractor shall provide a Monthly Control Tower Report delineating the traffic count, identification of aircraft, call sign and dates to the COTR on the 10th day of the following month (or on the Monday following a weekend).

All communications and other operational equipment currently installed in the WRR Airport Control Tower required for control tower operations shall be maintained and sustained by the contractor.

Maintenance of airfield infrastructure is NOT in the scope of this contract. The contractor shall however identify and propose airfield infrastructure maintenance, upgrades, etc., to the NASA Airport Manager to ensure airfield safety and services are maintained.

14 WIDE AREA NETWORK (WAN) SERVICES

The contractor shall provide and manage the interfaces for all WAN services required to support the WRR including Systems Administration of systems supporting LAN services.

The contractor shall work with Wallops Code 708 to define requirements for WRR missions requiring WAN services.

Code 708 will provide the actual WAN services providing communications to and from WFF, but the contractor shall provide mission WAN requirements to Code 708 and manage all WAN interfaces that reside in mobile and fixed range instrumentation and facilities operated by the contractor.

The contractor shall, for each site location, define WAN interfaces and lines of demarcation and develop a common-format Interface Control Document (ICD) between the WAN and that location. No current ICD's exist.

The contractor shall ensure a consistent baseline description of each interface at every site.

The contractor shall update and maintain the ICDs to ensure continued technical accuracy and submit revised ICDs as needed through the configuration control process.

The contractor shall document the interfaces only to the demarcation point of the services they are responsible unless tasked otherwise by the Government to perform this additional configuration management function.

The Contractor shall designate a WAN representative and an alternate for each site when missions are underway (with the Wallops location being defined as one site and remote locations being a separate site) who will serve as the site focal point for all WAN activity.

The WAN representative shall be responsible for scheduling maintenance periods during non-operational hours to perform approved upgrades, maintenance activities, and testing.

The contractor shall perform preventive maintenance activities at intervals determined by manufacturer recommendations and operational experience to ensure maximum equipment availability and reliability.

The contractor shall periodically review preventive maintenance procedures and results to ensure compliance and effectiveness and present recommended configuration changes using the configuration control process.

15 LOGISTICS SUPPORT SERVICES

The contractor shall provide Government property management and logistics services for all areas of the WRR activity.

The logistics function shall consist of materials shipping, handling, research, procurement, equipment calibration, and property and inventory support.

The contractor shall establish, maintain, and implement a Logistics Management Plan to ensure compliance with service requirements in this SOW and/or established by the contractor. This plan will be an attachment and become part of the contract.

15.1 Shipping Services

Shipments shall be managed by the contractor and made to destinations both domestic and foreign.

Specialized sensitive electronics equipment packing for property controlled by the contractor shall be performed by the contractor to ensure proper protection and operational reliability upon arrival at the destination and its return to WFF.

It shall be the responsibility of the contractor to initiate all required shipping documentation, obtain required approvals/signatures, and coordinate with the Government provided onsite shipping agent to ensure proper and timely delivery as required meeting range operations schedules and requirements and with sufficient lead time and risk reduction.

Special handling/shipping considerations (mobile instrumentation, sensitive electronics, etc.) are often required and it shall be the contractor's responsibility to ensure these special shipment requirements are communicated properly to the onsite shipping agent and confirmed prior to shipment.

The contractor shall be responsible for the timely completion of all relevant requirements of International Traffic in Arms Regulations (ITAR) 22 C.F.R. Chapter I, Subchapter M Parts 120-130. This includes developing and obtaining all required approvals for any Technical Assistance Agreements that may be necessary as a result of foreign national involvement in assigned tasks.

The contractor shall also be responsible for the timely completion of all relevant requirements of Export Administration Regulations (EAR); Department of Commerce, Bureau of Industry and Security, 15 CFR 730-774.

The Government will obtain all export licenses required for the shipment of any range systems, ground support equipment, materials or supplies that are being shipped by the Government to foreign countries.

15.2 Research and Procurement Services for Spare Parts

The contractor shall provide spare parts and maintenance services for WRR instrumentation at a level which assures availability meeting or exceeding the systems performance metrics.

It shall be the responsibility of the contractor to ascertain the current state of the spares pool by reviewing the Installation Accountable Government Property list.

15.3 Equipment Depot Services

The contractor shall manage and store equipment and supplies in locations that maximize instrumentation availability and security.

The contractor shall manage all equipment stores to ensure supply inventory meeting operations requirements and operations performance metrics.

15.4 Property Management Services

The contractor shall support the Government's maintenance of an accurate inventory of all equipment as well as receipt and distribution of excess equipment.

In order to provide accountability and ensure accurate records, the contractor shall verify purchase records and present physical audits of the assets upon Government request of all Installation Accountable Government Property.

Upon COTR approval, the contractor shall provide access to and use of Installation Accountable Government Property by NASA civil servants or other contractors on a temporary basis provided that such use of the property does not interfere with the contractor's ability to meet contractual requirements and performance metrics.

15.5 Test Equipment Calibration Services

Calibration laboratory services for test and operational equipment will be provided by the Government on-site. The contractor shall be responsible for ensuring all equipment is calibrated per contractor and manufacturer defined directives and shall maintain calibration certifications current. The contractor shall be responsible for delivering equipment to/from the on-site calibration laboratory at Wallops Flight Facility. For those calibration services not obtainable from the on-site Government provided service due to technical or responsiveness requirements, the contractor shall obtain alternative calibrations services for those items, with approval from the CO.

Acronym List

ASOS	Automated Surface Observation System
ASR	Airport Search Radar
ASRF	Atmospheric Scientific Research Facility
CATV	Cable Television
CCB	Configuration Control Board
CDR	Critical Design Review
CM	Configuration Management
CMMI	Capability Maturity Model Integration
COTR	Contracting Officer's Technical Representative
COTS	Commercial Off-The-Shelf
CSOC	Consolidated Space Operations Contract
CTO's	Control Tower Operators
DISS	Digital Ionospheric Sounding System
DLM	Depot Level Maintenance
DMR	Detailed Mission Requirements
DMSP	Defense Meteorological Satellite Program
DoD	Department of Defense
DQCA	Data Quality Computer - System A
DQCB	Data Quality Computer - System B
DR	Discrepancy Report
ELV	Expendable Launch Vehicle
ER	Eastern Range
FCC	Federal Communications Commission
FOM	Facilities Operations Manager
FSO	Flight Safety Officer
GFE	Government Furnished Equipment
GFP	Government Furnished Property
GFS	Government Furnished Services
GMT	Greenwich Mean Time
GPMC	Goddard Project Management Council
GPS	Global Positioning Satellite
GSFC/WFF	Goddard Space Flight Center's Wallops Flight Facility
HF	High Frequency
HVAC	Heating Ventilation and Air Conditioning
ICD	Interface Control Document
IDIQ	Indefinite Delivery Indefinite Quantity
IRIG	Inter-Range Instrumentation Group
IRIS	Integrated Range Information Systems
IRSP	Instrumentation Radar Support Program
ISO	International Standards Organization
ISS	International Space Station
IT	Information Technology
KVA	KiloVolt-Amps
KW	KiloWatts

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LEADS	Leading Environmental Analysis and Display System
LMR	Land Mobile Radio
LOA	Letter Of Agreement
MCS	Mobile Command System
MRCS	Mobile Range Control System
MSR	Monthly Status Reviews
NAC	National Agency Check
NACA	National Advisory Committee for Aeronautics
NASA	National Aeronautics and Space Administration
NCS	National Communications System
NENS	Near Earth Networks Services
NISN	NASA Integrated Services Network
NOAA	National Oceanographic and Atmospheric Administration
NPOL	NASA Polarimetric Radar
NRP	National Resource Protection
NSEP	National Security Emergency Preparedness
NTSC	National Television System Committee
NWS	National Weather Service
ODIN	Outsourcing Desktop Initiative for NASA
ORR	Operational Readiness Review
OSD	Operations and Safety Directive
PCDQS	Personal Computer Data Quality System
PCGDS	Personal Computer Graphics Display System
PDR	Preliminary Design Review
PFRR	Poker Flat Research Range
PMs	Project Managers
PMSR	Post Mission Services Report
PPR	Permit Prior Request
PRD	Program Requirements Document
RADAC	Radar Data Acquisition Computer
RADCAL	Radar Calibration Satellite
RCC	Range Control Center
RF	Radio Frequency
RGB	Red Green Blue
RMMO	Range and Mission Management Office
RMS	Root-Mean-Square
ROMS	Range Operations Management System
RRR	Range Readiness Review
RSM	Range Services Manager
RSO	Range Safety Officer
RSRC	Range Surveillance and Recovery Coordinator
RYG	Red Yellow Green
S3	Ship Surveillance System
SGI	Silicon Graphics Incorporated
SHARES	Shared Resources
SIPS	Selectable Internet Protocol Slaving

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SRR	Systems Requirements Review
TCP	Transmission Control Protocol
TDRSS	Tracking and Data Relay Satellite System
TOGA	Tropical Ocean Global Atmosphere
UAS	Uninhabited Aerial System
UAV	Unmanned Aerial Vehicle
UDP	User Datagram Protocol
UDS	Universal Documentation Systems
UHF	Ultra High Frequency
UPS	Uninterruptible Power Supply
UTC	Universal Time Code
VHF	Very High Frequency
WAN	Wide Area Network
WAR	Weekly Activities Report
WIIMS	Wallops Integrated Institutional Management System
WOTS	Wallops Orbital Tracking Station
WRR	Wallops Research Range